ATOMIC ENERGY newsletter

THE FIRST AND ONLY ATOMIC NEWS SERVICE

ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

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Dear Sir:

The United States Atomic Energy Commission's budget for the 1953 fiscal year (starting July 1st, 1952) was set at $1,485,000,000.00 by the House of Representatives sitting in Washington last week. Of this total, $1,450,000,000.00 is to be used for plant and equipment, with $35,000,000.00 for operating expenses. The House also refused, by a vote of 92 to 29, to permit the USAEC to make any "starts" on its expansion program for which full funds were not available. According to Representative Albert Thomas, chairman of the appropriations subcommittee that studied the program, the USAEC had failed to produce plans and specifications for an expansion program. (This expansion program is to cost $4 billion, and would take about 6 years to be carried out, including the roads, power lines, larger plants, etc., which it would entail.) Representative Thomas stated that the appropriations subcommittee had cut the USAEC's money requests almost in half, in order to force that agency to present detailed plans for its program, but to no avail.....The Tennessee Valley Authority, which had requested $150,000,000.00 in funds, to be used in a $305,000,000.00 expansion program of 10 additional steam generating units for the USAEC's power needs, had its funds cut to $85,000,000.00, by the House.

The two day conference at Massachusetts Institute of Technology, Cambridge, in the last fortnight, on "Building in the Atomic Age" heard experts pronounce that a balance must be attained between bomb-resistant construction, and dispersal. Conferes agreed that it is technically possible to protect structures completely against failures under blasts from nuclear weapons, but felt that the problem should not be considered in terms of maximum protection. Dr. John B. Wilbur, head of the MIT Department of Civil and Sanitary Engineering, pointed out that buildings are not made completely safe against fire hazards. Rather, he observed, "we strive for the greatest resistance we can afford considering all the factors involved". He asked for the same kind of thinking in connection with protection against atomic bombs, and said that vast strides can be made if only certain minimum steps are carried out.

A special Summer course titled "Major Aspects of Atomic Energy" is being given by Columbia University, New York City, during the July 7-August 15 Summer session. Aimed especially at high school science teachers, a knowledge of elementary college chemistry or physics will be necessary, but very little mathematical training will be required to understand the course material, according to Dr. Robert W. Houston, assistant professor of chemical engineering who has organized and is directing the course.

Dr. George L. Weil, assistant director of the USAEC's reactor development division, has resigned to become a private consultant in nuclear reactor design and engineering. Dr. Weil will deal particularly in problems of experimental nuclear power plants for industrial and other private organizations. A veteran in the Government's atomic energy program, Dr. Weil started in the field of atomic energy in 1940 when he joined a group working under Enrico Fermi at Columbia University.

BUSINESS BRIEFS...in the nuclear energy field...

NEW UNIT ESTABLISHED- A nuclear power development department has now been established by the Detroit Edison Company. The new department will coordinate the atomic energy studies of Detroit Edison. The firm, with Dow Chemical Company, of Midland, Michigan, is working under a joint USAEC contract on a study to determine the feasibility of producing economic electric energy from a nuclear reactor.

ELECTRIC ENERGY FROM NUCLEAR FUEL- Technical "know-how" gained through developing mobile nuclear reactor-propelled units for the military has hastened the time when usable electric energy can be obtained from nuclear fuel, Dr. Norman L. Mochel, manager of metallurgical engineering told the American Society for Testing Materials at the ASTM's annual meeting last week in New York. Dr. Mochel observed that the mobile power unit (for submarine, aircraft, or large surface travelling vehicle) produces, concurrently, large amounts of power and fissionable materials needed for military purposes. He pointed out that "from studies made by executives of electrical utilities and a group of utilities studying the problem for the USAEC, the general conclusion can be reached that the economics of atomic power are not attractive without selling the by-product, plutonium, to the Government". Dr. Mochel noted that by concentrating a large percentage of the engineering manpower of the country on the problems of reactor materials, coolants, pumps, and control equipment, important studies have been made. As a result of this, he stated, electrical utility interests are much more optimistic about the date when electric power will be generated using atomic power as the heat source.

URANIUM SUPPLY- Blockson Chemical Co., Joliet, Ill., which has been conducting research under a USAEC contract on a process for the extraction of uranium from phosphate rock, has completed the pilot plant stage of this development and has facilities under construction for full-scale recovery. The building which houses the process will cost about $250,000.00, for which the company has received a certificate of necessity. (Blockson recently proposed to sell 500,000 shares of its common stock in a public offering; the shares had been held by members of the Block family. Last year Blockson earned $4.2 million before taxes, and $2.8 after taxes, equivalent to $1.91 a share on the stock. Sixty per cent of the firm's business last year was in supplying raw materials for synthetic detergents.)

LIMITATIONS ON RADIATION FOR STERILIZATION- A warning that foods rich in fatty acids, such as salad oils, butter, milk, fatty meats, certain grains and seeds should not be sterilized with gamma radiation, has been made by Dr. James F. Mead, of the biochemistry division, of the atomic energy project of the University of California at Los Angeles. While recent work has been directed to the use of gamma radiation (from nuclear waste products) for food sterilization, Dr. Mead explained that if foods with a high concentration of fatty acids are subjected to gamma radiation, these acids and vitamins in the foods will be destroyed. He stated that irradiation releases a chain of free radicals in the food, and that these free radicals act on other substances present to produce poisonous peroxides. The peroxides released, Dr. Mead said, are injurious to vitamins and essential fatty acids already in the body.

MECHANICAL ENGINEERING EQUIPMENT TOPS PURCHASES- Manufacturers of mechanical engineering equipment supplied the USAEC with $69.4 million worth of equipment during the 1950 and 1951 fiscal years, an analysis of the USAEC's purchases in that period shows. Steel production companies were next, having supplied some $61.4 million worth. All told, USAEC expenditures for equipment and supplies during those two years were spread through 41 different industries, involving thousands of individual companies. In the chemical field, the USAEC has been buying chemical materials at the rate of about $10 million per year, and plans are to step up these purchases during the next few years by about one-third.

ISOTOPES IN CANADA- The Science Service Laboratory, now being established at the University of Western Ontario, London, Ont., is to have a special section equipped for use of radioisotopes. The laboratory is designed for entomological studies including the effect of agricultural chemicals on insect life. In these studies, isotopes will be used to trace both the life cycles of insects, and the action of chemicals. Radioactive carbon and phosphorous will be used in this research.

THE ATOMIC ENERGY COMMISSION LOOKS AT THE FUTURE; Remarks by T. Keith Glennan, USAEC Commissioner, at Dartmouth College meeting of American Society for Engineering Education, June 24th, 1952.

The Atomic Energy Commission and its staff are keenly aware that if atomic energy is ever to be made importantly useful in peacetime applications, industry, educational institutions, and government must each take an effective part in its development.

Industry must do its part by participating in atomic energy developments even though significant short-term financial return on investments may not be easily foreseen. Our universities, and particularly the science and engineering schools, must turn out the required number of professional personnel well trained in the fundamentals of science and engineering and equipped to fit into the atomic energy programs of industry and government.

Let's look for a moment at the present state of the atomic energy art. We know how to produce fissionable materials, and to produce them in substantial quantity. While great advances have been made in the technology involved in the separation of U-235 atoms from U-238 atoms, and the transmutation of U-238 into the end product plutonium, it must be remembered that throughout the past nine years almost all of the work in this field has been to meet military and defense requirements. Such an atmosphere is not particularly conducive to relaxed thinking and the taking of extraordinary chances in the search for radical improvements. Nevertheless, it can be said that fissionable material is in reasonably abundant supply and that our supplies are becoming increasingly large at an accelerating rate.

We know how to manufacture destructive bombs of many types on mass production schedules; we have substantial stockpiles of atomic bombs. We are expanding our plants for the production of fissionable materials and enlarging our manufacturing activities to enable us to make even more weapons.

Mobile reactors for naval use are now being built. (For the submarine Nautilus, the keel plate of which was laid in the last fortnight, the reactor uses uranium as fuel and high-pressure, high-temperature water as the heat exchange medium for transferring nuclear heat to the boiler of the steam turbine propulsion plant.) If we are successful in this endeavor, there will be a firm demand for conversion to naval propulsion under atomic power. We are also in the early stages of the designing of a reactor for the propulsion of aircraft. Although this is a job of almost unbelievable difficulty, there is little question in my mind that, given an adequate amount of money and sufficient time, success will be achieved.

There has also been generated small amounts of uneconomical electric power, incidental to the main experimental purpose of a reactor. What the future holds for this production of electric energy from atomic energy only time itself will tell. If reactor developments turn out successfully, and costs can be reduced, there will be an increasing demand for stationary nuclear power plants. This demand naturally will arise first where present costs for electrical energy are high, and this suggests that such a program may have an important place in any future Point Four programs. As you probably know, the USAEC has made agreements with four industrial groups permitting them to make surveys and studies leading toward the finding of ways by which a larger share of the task of developing, building, and operating reactors can be carried by industry. One of these groups, the Dow-Detroit Edison combine, has already agreed to participate in the financing of continued research and development studies. The other groups are not far behind, and their interest is very real.

A large and continuing growing interest in the use of isotopes for research in medicine, agriculture and industry leads us into another facet of the atomic energy business. You may give your imagination free play in this matter, for the importance of the isotope as a research tool cannot be over-stated. Right now, we are in a position where we can see occasionally glimpses of the atomic energy field ahead of us. We cannot with certainty predict the exact nature of the developments to be undertaken in the next five to ten years. We do know one thing with certainty --none of the hoped for progress will occur unless the minds of well-trained men are available and interested in this field.

ATOMIC PATENT DIGEST...latest U. S. grants and applications...

The following 40 U. S. Government-owned patents, developed in the course of nuclear investigations, have now been made available to the public. Applications for licenses for this new group (as well as for the 419 patents of similar type) should be made to the Patent Branch, USAEC, Washington 25, D. C. This new group comprises: (1) Ion Gauge Mounting, Pat. No. 2,594,212. An improved mounting, which is compact, and so designed that extraneous oscillating regions are avoided. (2) Thermal Flowmeter, Pat. No. 2,594,618. This flowmeter has a high sensitivity that is distinguished by readings that are primarily a function of the mass flow rate. (3) Flowmeter, Pat. No. 2,594,668. In this flowmeter, the gas to be metered is passed through a capillary tube into an electrolyte, and by means of suitable electrical connections the rate at which bubbles of gas are delivered from the immersed end of the capillary are counted. (4) Photomultiplier Tube Circuit, Pat. No. 2,594,703. An improved circuit whereby, by pulsed operation to avoid deleterious overloading, the tube may be operated at voltages much higher than the normal operating voltage. (5) Viewing Device for Radioactive Materials, Pat. No. 2,594,970. This patent covers a viewing box for radioactive materials. (6) Magnetic Contouring System, Pat. No. 2,594,989. A method of contouring the flux intensity emanating from a magnetic surface. (7) Universal Manipulator for Grasping Tools, Pat. No. 2,595,134. (8) Radiation Counter, Pat. No. 2,595,550. An improved radiation counter tube of the proportional type, with high sensitivity for alpha particles, high geometry, and high tolerance to beta background. (9) Photomultiplier Coincidence Circuit, Pat. No. 2,595,552. An improved photomultiplier coincidence circuit for use with scintillating crystal detectors. (10) Ionization Gauge, Pat. No. 2,595,611. An improved electronic pressure gauge which is adaptable to simple electronic regulation of the ionizing current flow therein, thereby making it possible to obtain accurate and steady readings. (11) Fission Indicator, Pat. No. 2,595,622. In this method and means for indicating fission and determining fission cross sections, ionization caused by the fission fragments is indicated without interference due to ionization caused by charged particles producing the fission. (12) Quaternary Bismuth Alloy, Pat. No. 2,595,924. A low melting point alloy. (13) Quaternary Bismuth Alloy, Pat. No. 2,595,925. A low melting point alloy. (14) Uranium-Aroyl Aldehyde Complexes and Method of Making Same, Pat. No. 2,596,047. New and useful chelate compounds of uranium. (15) Ionization Chamber, Pat. No. 2,596,080. An improved chamber. (16) Fluorinated Compounds, Pat. No. 2,596,084. Certain perfluorinated compounds for use as lubricants. (17) Pocket Radiation Alarm, Pat. No. 2,596,500. A lightweight, reliable, pocket size integrating radiation exposure device. (18 (19) & (20) Vibration measuring Device, Pat. No. 2,596,529, 2,596,530, & 2,596,531. (21) Electronic Relay Circuit, Pat. No. 2,596,956. An improved direct-voltage actuated electronic relay circuit. (22) Radioactive Assay Apparatus, Pat. No. 2,597,535. A shielded apparatus to assay fissionable material. (23) Insulator Bushing Seal, Pat. No. 2,597,596. A mechanical seal for the stem or the like passing through the side wall of an evacuated chamber. (24) Ionization Chamber, Pat. No. 2,598,215. A device particularly adapted to measure alpha radiation. (25) Copolymers of Perfluoropropene & Tetrafluoroethylene, Pat. No. 2,598,283. (26) Rearrangement of Saturated Halocarbons, Pat. No. 2,598,411. (27) Thermal Neutron Detector Element, Pat. No. 2,599,156. A detecting and counting device. (28) Method of Identifying Radioactive Compounds, Pat. No. 2,599,166. (29) Pulse Type Transformer, Pat. No. 2,599,182. An improved method for winding a low leakage transformer. (30) Magnetic Peeler for Proton Synchrotron, Pat. No. 2,599,188. (31) Preparation of Aluminum Borohydride, Pat. No. 2,599,203. (32) Decomposition of Complex Metal Phosphate Salts, Pat. No. 2,599,326. (33) Monitoring of Gas for Radioactivity, Pat. No. 2,599,922. (34) Oxidation Inhibitors of Uranium Oxide, Pat. No. 2,599,946. (35) High Voltage Transformer, Pat. No. 2,600,057. (36) Ion Producing Mechanism, Pat. No. 2,600_151. A simple and unique ion generator employing electron bombardment of the solid body to be ionized. (37) Direct to Alternating Current Signal Converter, Pat. No. 2,600,172. An improved modulator circuit and apparatus. (38) Uranium Borohydride and Method of Making Same, Pat. No. 2,600,370. (39) Vacuum System Leak Detector, Pat. No. 2,600,891. (40) Method and Apparatus For Measuring Low-Pressures and Related Conditions, Pat. No. 2,600,936. An improved apparatus and method of measuring pressure.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

Hand and foot counter for monitoring of bata-gamma contamination on the hands and feet of radiolaboratory technicians; said to be the first completely automatic device of its kind. Designed for routine monitoring of untrained personnel, the device's automatic controls make it simple and foolproof to use. In operation, the user steps onto a platform and places his hands in two paper lined slots. Automatic switches light up a "counter in operation" sign, and then indicate whether the check is satisfactory or if decontamination is required. If the user does not operate the unit for the correct length of time, another sign lights up advising him to reset the machine and repeat the check. The time interval for the complete test is controlled by a mechanism within the locked cabinet, and the device automatically resets itself after completion of the test and sufficient additional time to permit reading of the indicating lights. Five banks of decade indicators at eye level show measurements of both sides of each hand and of both feet. The new monitor is 6-feet high, and 2½-feet wide, and a raised platform in the front houses the detectors for foot contamination; operation is on 110-volt, 60-cycle power supply.--Nuclear Instrument & Chemical Corp., Chicago 10, Ill.

A new radioactive current source has the following features, its maker points out: Maximum voltage--1 KV to 3 KV; Linear charging rate--to 100-volts; Constant current at 0 voltage. The battery differs from other radioactive cells now on the market in that the kinetic energy of the emitted particles is used directly to build a voltage. The only measurable variation in the current at low voltage is that due to radioactive decay. As half-lives of isotopes used are long and accurately known, it is easy to calibrate the battery for this variation. Its makers feel that the battery should have wide application as a voltage source for dielectric tests. The battery's linear charging characteristics suggest its application in timing circuits. It is also a useful device for calibrating ion chambers, and high megohm resistors. The manufacturer now has laboratory models available in limited quantity for experimental and test purposes.--Radiation Research Corp., 526 Northwood Rd., West Palm Beach, Fla.

NOTES:- Fast differential pulse height analyzers (twenty channel) of advanced design are now being built for the Navy Department and the USAEC (at Oak Ridge) by the Atomic Instrument Company, Cambridge 39, Mass.

Urea-C-14 has now been made available commercially for the first time by Tracerlab, Inc., Boston 10, Mass. This radioactively labeled intermediate is useful for the synthesis of various biochemical compounds such as purines and pyrimidenes as well as the preparation of urea-containing plastics. Specific activity will be 1 millicurie per millimole.

A post doctoral fellowship at the University of Utah, Salt Lake City, has now been established by Radioactive Products, Inc., Detroit, Michigan. The fellowship will be for research on synthesis of radioactive carbon labeled steroids.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Annual Review of Nuclear Science. Volume 1, now available, of a useful work. 645 pages. --Annual Reviews, Inc., Stanford, Calif. ($6.00)

Radioactive Atoms and Isotopic Tracers. The 26th annual Priestly lectures.--Phi Lambda Upsilon, Department of Chemistry, Pennsylvania State College, State College, Pa. ($2.00)

Protection of Mice Against X-Irradiation by Spleen Homogenates Administered after Exposure. Work done at the U. S. Naval Radiological Defense Laboratory, San Francisco, Calif. (Microfilm, $1.75; photostat, $2.50).....Radiological Clothing Monitor. A study conducted by the U. S. Chemical Corps., Technical Command, Army Chemical Center, Md. (Microfilm, $1.75; photostat, $2.50). Note: These two publications are available from Photoduplication Service, Library of Congress, Washington 25, D.C., at prices as indicated.

Sincerely,

The Staff
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